ALABAMA DEPARTMENT OF TRANSPORTATION

Bureau of County Transportation
1409 Coliseum Blvd., Montgomery, Alabama 36110-2060
Phone: (334) 242-6206 FAX: (334) 353-6530
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Bob Riley
Governor

Joe McInnes
Transportation Director

June 25, 2007

MEMORANDUM 2007-11

To: County Engineers

Cc: Division County Transportation Engineers

From: _____
D.E. (Ed) Phillips, Jr., P.E. State County Transportation Engineer

RE: County Bridge Foundation Investigations

The purpose of this Memorandum is to offer some guidance concerning the requirements for county bridge foundation investigations outlined in County Transportation Bureau Memorandum 2006-14, dated March 27, 2006 (attached). Memo 2006-14 gives two options when constructing county bridges with span lengths of 41 feet or less using pile bent construction. The first option is to perform a minimum of one core boring where D-50s for scour analysis and a static analysis to determine minimum tip elevations are obtained. The second option is to gather a soil sample(s) representative of the bed material and obtain a D-50 for scour analysis.

If the first option is selected this office recommends that the County Engineer specify the number of borings, the depth of the boring(s), the soil sample tests desired, and the frequency of the soil sample tests from the boring. We also recommend that a written cost estimate be obtained from the lab prior to approving any work to be performed.

If the second option is selected this office recommends that the County Engineer either collect the sample themselves and provide it to the lab along with direction for the type of soil test requested, or specify to the lab the number and method of sample collection and the number and kind of sample tests desired. We also recommend that a written cost estimate be obtained from the lab prior to approving any work to be performed. At a minimum, one soil sample should be obtained and the lab should provide a D-50 from this sample. This office does not recommend the use of this option unless the County Engineer is intimately familiar with the soils in the project area and is reasonably sure that the soil sample(s) gathered will be representative of the bed material to a depth that piles can be expected to be driven.

This office recommends that the first option be utilized. The County Engineer should be reasonably knowledgeable as to what depth piles can be expected to be driven, and should therefore be able to specify the depth of the boring(s). Furthermore, this office would

recommend that one set of soil tests (N-value and D-50) be performed for each strata of bed material encountered from the boring, rather than specifying an arbitrary depth interval (i.e. every 5 feet, etc).

This guidance is provided in an effort to ensure that the minimum amount of geotechnical data (no more and no less) is obtained while ensuring that all parties know what is expected and what the estimated costs will be.

If you should have any questions or comments concerning this matter, please feel free to contact me at (334) 242-6203.

DEP/dep

Pc: Mr. Joe McInnes, Transportation Director
Mr. Don Vaughn, P.E., Chief Engineer/Deputy Director
Mr. Don Arkle, P.E., Assistant Chief Engineer, Policy & Planning
Mr. Larry Lockett, P.E., State Materials & Tests Engineer
Mr. Fred Conway, P.E., State Bridge Engineer
Mr. Mack Lovelady, P.E., Assistant State County Transportation Engineer
Mr. Ed Austin, P.E., Assistant State County Transportation Engineer
Mr. Don Harris, P.E., Assistant State County Transportation Engineer
Mr. Buddy Sharpless, ACEA
File

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Bob Riley
Governor

Joe McInnes
Transportation Director

March 27, 2006

MEMORANDUM NO. 2006-14

TO: ALL COUNTY ENGINEERS AND DIVISION
COUNTY TRANSPORTATION ENGINEERS

FROM: JOHN F. COURSON
COUNTY TRANSPORTATION ENGINEER

RE: NEW POLICY FOR COUNTY BRIDGES WITH SPAN LENGTHS OF 41 FEET OR LESS USING PILE BENT CONSTRUCTION

Attached is the new revised County Bridge Policy. This policy will go into effect immediately for all county bridge projects for which bridge plans have not been completed. Completed bridge plans for projects scheduled for letting in the June 30, 2006 letting or later will be reviewed by the Bridge Bureau for scour evaluation and may require revisions to comply with the new guidelines.

If you have any questions regarding these guidelines, please feel free to call.

JFC:at
Attachment
cc: Mr. D. W. Vaughn
FHWA
Mr. Rex Bush
Mr. Mike Harper
Mr. Don Arkle
Mr. Fred Conway
Mr. Larry Lockett
Mr. George Conner
File

STATE OF ALABAMA
DEPARTMENT OF TRANSPORTATION
GUIDELINES FOR COUNTY BRIDGE PROJECTS

POLICY FOR COUNTY BRIDGES WITH SPAN LENGTHS OF 41 FEET OR LESS USING PILE BENT CONSTRUCTION

HP 12x53 piling will be the minimum pile size used on all bridges. HP 10x42 piling will no longer be allowed in any locations.

Piling used in the wire rope abutment anchor assemblies and wing piles shall be driven to refusal or 20', whichever is less. Abutment and bent piles shall be driven to refusal or to the minimum tip elevation shown on the plans. The minimum penetration for any pile shall not be less than 10 feet into natural ground and not less than 1/3 the length of the pile. If at least 10 feet of pile penetration cannot be obtained, then concrete pedestals or pilot holes shall be used.

A minimum of one (1) core boring for foundation design will be required and shown on the plans with sufficient data obtained to conduct a scour analysis and a static analysis to determine minimum and estimated pile tip elevations. If the scour analysis indicates the scour depth could extend within 10 feet of the minimum tip elevation for the piling, the county will have the option of plating the entire footprint of the structure with rip-rap, even if the recommended bridge is greater than 5 spans, or considering a different foundation design with longer spans or analyzing the bridge to determine if it will be stable for the computed depth of scour. A comparative cost analysis should be prepared by the County and approved by the State to determine which option should be used.

OR

Representative samples of soil defining the bed material size, gradation and distribution will be obtained from the stream bed and overbank under the proposed bridge for the purpose of performing a scour analysis as outlined in FHWA's HEC-18, Evaluating Scour at Bridges. These samples shall be furnished to an independent certified lab, Division Materials Lab or Materials and Tests Lab for them to furnish the County a D-50 to be furnished with the plan-profile sheet and other required data submitted for a hydraulic site inspection. This D-50 will be used to calculate scour. If the scour analysis indicates that the area is highly susceptible to scour or if excessive velocities, (greater than 5

ft/sec.) are calculated, the site report will indicate that the entire footprint of the bridge shall be plated with rip-rap in accordance with current standard drawings.

The county will have the option of plating the entire footprint of the structure with rip-rap, even if the recommended bridge is greater than 5 spans, or considering a different foundation design with longer spans. A comparative cost analysis should be prepared by the County and approved by the State to determine which option should be used.

If this option is chosen and the recommended bridge is 5 spans or less, piling shall be driven to refusal as defined by the specifications and no core boring is required.

If the site inspection determines that a structure longer than five (5) spans is required, then at least one core boring will be required for foundation design and scour analysis. More that one core boring is desirable for bridges longer than 5 spans.

A load test will be included as a pay item on all short span (41 ft. length spans or less) county bridges. The purpose of the load test is to confirm pile bearing capacity therefore a pile driving hammer approval will be waived.

RECOMMENDED FOR APPROVAL: John L. Benson 3/16/06
County Transportation Engineer **Date**

APPROVED: 3-16-06
Assistant Chief Engineer, Pre-Construction **Date**

APPROVED: 3-23-06
Assistant Chief Engineer, Operations **Date**

APPROVED: 3-27-06
Chief Engineer **Date**